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| EXAMINER | |
|---|---|
| BODDIE, WILLIAM | |
| **ART UNIT** | **PAPER NUMBER** |
| 2629 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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| 3 MONTHS | 02/20/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/613,449 | UTT ET AL. | |
| | Examiner | Art Unit | |
| | William L. Boddie | 2629 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1-43 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-43 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. In an amendment dated January 12th, 2007 the Applicants amended claims 1-3, 29-31, 38 and 40. Currently claims 1-43 are pending

### *Continued Examination Under 37 CFR 1.114*

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 12th, 2007 has been entered.

### *Response to Arguments*

3. Applicant's arguments with respect to claims 1-43 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-6, 8-10, 17, 19 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nicolas (US 4,859,053) in view of Shimizu (US 3,737,214).

**With respect to claim 1,** Nicolas discloses, a display system comprising:

a display surface having a three-dimensional convex shape (5 in fig. 1); and

a projection system for projecting an image at an object field (slide; col. 3, line 64 – col. 4, line 2) onto a continuous image field on an interior of the display surface (sphere in fig. 1), wherein a ratio of a longest image distance to a shortest image distance is at least 1.25 (approximate based on fig. 1), and an image distance at an apex image point is longer than an image distance at a full field image point (clear from fig. 1).

Nicolas does not expressly disclose where, an intermediate image is used in projection or that the ratio of a longest image distance to a shortest image distance is at least 1.75.

Shimizu discloses, a wide angle fisheye lens whose angle of field is as wide as 220 degrees (fig. 1), wherein the rearward lens group contains an intermediate image (middle of rearward lens group).

Shimizu and Nicolas are analogous art because they are from the same field of endeavor namely display optics and wide angle display systems.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the lenses of Nicolas with the wide angle lens of Shimizu.

It appears clear to the Examiner, that should the lens system of Nicolas be exchanged with Shimizu that the claimed ratio of 1.75 would be easily achieved and likely surpassed by the combination.

The motivation for doing so would have been the simplicity and efficiency of Shimizu's lens system (Shimizu, col. 4, lines 38-39) as well as to simply increase the spherical coverage that is projected on by Nicolas.

Therefore it would have been obvious to combine Shimizu with Nicolas for the benefit of increase efficiency and increased visual affect to obtain the invention as specified in claim 1.

**With respect to claims 2-3,** Nicolas and Shimizu disclose, the display system of claim 1 (see above).

As to what degree of coverage the combination will achieve these limitations are seen as optimum values that are obvious and achievable without undue experimentation.

**With respect to claim 4,** Nicolas and Shimizu disclose, the display system of claim 2 (see above).

Nicolas further discloses, wherein the display surface is approximately spherical (clear from fig. 1).

**With respect to claim 5,** Nicolas and Shimizu disclose, the display system of claim 4 (see above).

Nicolas further discloses, wherein the display surface is translucent (col. 3, lines 13-17).

**With respect to claim 6,** Nicolas and Shimizu disclose, the display system of claim 2 (see above).

Nicolas further discloses, wherein the display surface includes an aperture (8 in fig. 1).

It seems clear to the Examiner that the ray diagram of Shimizu in figure 1 would draw the image field to cover substantially the entire interior of the display surface.

**With respect to claims 8-9,** Nicolas and Shimizu disclose, the display system of claim 6 (see above).

Nicolas further discloses, wherein the optical axis of the projection system enters the interior of the display surface via the aperture (clear from fig. 1) and is also tilted relative to vertical (completely horizontal; fig. 1)

**With respect to claim 10,** Nicolas and Shimizu disclose, the display system of claim 2 (see above).

Shimizu further discloses a lens array (fig. 1) that is substantially equivalent to the applicant's lens system (Applicant's fig. 9a) all of the properties of the applicant's lens system would thus inherently be properties of Shimizu's lens array. Therefore Shimizu's lens array is inherently capable of projecting a virtual object field.

**With respect to claim 17,** Nicolas and Shimizu disclose, the display system of claim 10 (se above).

Nicolas further discloses, wherein the projection system can accommodate displays surfaces of varying size by varying a focus of the projector (col. 4, lines 21-23).

**With respect to claim 19,** Nicolas and Shimizu disclose, the display system of claim 2 (see above).

Nicolas further discloses, wherein the display surface is seamless (seems clear from the drawings disclosed by Nicolas).

**With respect to claim 25,** Nicolas and Shimizu disclose, the display system of claim 2 (see above).

Nicolas further discloses, wherein the display surface is spheroid in shape (clear from fig. 1).

6. Claims 7, 18 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nicolas (US 4,859,053) in view of Shimizu (US 3,737,214) and further in view of Young et al. (US 6,698,900).

**With respect to claim 7,** Nicolas and Shimizu disclose, the display system of claim 6 (see above).

Nicolas further discloses a physical support for the display surface (3 in fig. 1).

Neither Nicolas nor Shimizu expressly disclose, that the physical support hides the aperture from view.

Young discloses, physical support for the display surface, wherein the physical support hides the aperture from view (70 and 74 in fig. 7).

At the time of the invention it would have been obvious to one of ordinary skill in the art to hide the aperture of Nicolas and Shimizu from view as taught by Young.

The motivation for doing so would have been a more pleasing design aesthetic.

Therefore it would have been obvious to combine Young with Nicolas and Shimizu for the benefit of a more appealing design to obtain the invention as specified in claim 7.

**With respect to clam 18,** Nicolas and Shimizu disclose, the display system of claim 2 (see above).

Neither Nicolas nor Shimizu expressly disclose the materials of the display surface.

Young discloses, wherein a display surface comprises multiple materials (col. 9, lines 46-48).

Nicolas, Shimizu and Young are analogous art because they are all from the same field of endeavor namely, wide angle display systems.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the spherical screen of Nicolas and Shimizu with the multiple material screen of Young.

The motivation for doing so would have been to prevent leaks (Young; col. 9, lines 46-48).

Therefore it would have been obvious to combine Young with Nicolas and Shimizu for the benefit of preventing leaks to obtain the invention as specified in claim 18.

**With respect to claim 27,** Nicolas and Shimizu disclose, the display system of claim 2 (see above).

Neither Nicolas nor Shimizu expressly disclose, wherein the interior of the display surface is approximately in the shape of a rectangular solid.

Young discloses, wherein the interior of a display surface is approximately in the shape of a rectangular solid (col. 1, line 63, discloses the possibility of another geometric shape being used).

For merits of the combination see the above rejection of claim 7.

7. Claims 11-16, 22-24, 29-37 and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nicolas (US 4,859,053) in view of Shimizu (US 3,737,214) and further in view of Colucci et al. (US 6,880,939).

**With respect to claim 11,** Nicolas and Shimizu disclose, the display system of claim 10 (see above).

Neither Nicolas nor Shimizu expressly disclose, the projector also projects the object field onto a flat image field, wherein the object field for the projector is flat and the flat image field for the projector serves as the virtual object field for the lens system.

Colucci discloses, a projector (36, 32, 48, 52 in fig. 3) optically coupled to a lens system (34 in fig. 3), the projector also projects an object field onto a flat image field (intermediate image plane in fig. 3), wherein the object field for the projector is flat (clear from 36 in fig. 3) and the flat image field for the projector serves as a virtual object field (clear from fig. 3) for the lens system.

Nicolas, Shimizu, and Colucci are all analogous art because they are directed to a similar problem solving area, namely wide-angle optical systems.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to replace the projection unit of Nicolas and Shimizu with the projector of Colucci.

The motivation for doing so would have been to better the display quality by reducing the conflict between back focal distance and effective focal length.

Therefore it would have been obvious to combine Colucci with Nicolas and Shimizu for the benefit of increased display quality to obtain the invention as specified in claim 11.

**With respect to claims 12-15,** Nicolas, Shimizu, and Colucci disclose, the display system of claim 11 (see above).

Nicolas further discloses, that the image source is a slide projector (col. 3, lines 64-68).

Colucci further discloses, wherein the image source (projector) can be "a cathode ray tube, field emitter array, or any other two-dimensional image array." Colucci goes on to disclose DLP, LCD, and LCOS projector types (col. 4, lines 9-24).

**With respect to claim 16,** Nicolas and Shimizu disclose, the display system of claim 10 (see above).

Neither Nicolas nor Shimizu expressly disclose, wherein the virtual object field is generated by a projector, or that the lens system is adapted to be mechanically attached to the projector.

Colucci discloses, a projector (36, 32, 48, 52 in fig. 3) optically coupled to a lens system (34 in fig. 3), the projector also projects an object field onto a flat image field (intermediate image plane in fig. 3), wherein a virtual object field is generated by a projection (col. 4, lines 3-24) and the lens system is adapted to be mechanically attached to the projector (clear from figs. 2, 4).

Nicolas, Shimizu, and Colucci are all analogous art because they are directed to a similar problem solving area, namely wide-angle optical systems.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to replace the projection unit of Nicolas and Shimizu with the projector of Colucci.

The motivation for doing so would have been to better the display quality by reducing the conflict between back focal distance and effective focal length.

Therefore it would have been obvious to combine Colucci with Nicolas and Shimizu for the benefit of increased display quality to obtain the invention as specified in claim 16.

**With respect to claim 22,** Nicolas and Shimizu disclose, the display system of claim 2 (see above).

Nicolas further discloses, an integral projection lens system (11 in fig. 1) that projects an object field onto the continuous image field on the interior of the display surface.

Neither Nicolas nor Shimizu expressly disclose that the object field is flat.

Colucci discloses, wherein the object field is flat (clear from fig. 3 that the image source (36) is flat).

For further merits and motivation see the above rejections involving Nicolas and Shimizu in view of Colucci.

**With respect to claim 23,** Nicolas, Shimizu and Colucci disclose, the display system of claim 22 (see above).

Colucci further discloses, an object in the object field includes an electronically controlled display (col. 4, lines 9-24).

**With respect to claim 24,** Nicolas, Shimizu and Colucci disclose, the display system of claim 22 (see above).

As shown above in claim 22, Colucci discloses a flat object field, as well as disclosing that the image source can by any other two-dimensional image array.

Nicolas further discloses, wherein a slide projector is utilized for the image source. A slide projector is seen as a film-based display.

**With respect to claim 29,** Nicolas and Shimizu disclose, the display system of claim 1 (see above).

As noted above in the rejection of claim 1, Nicolas and Shimizu in combination disclose a continuous image field having a three-dimensional convex shape with a ratio of a longest image distance to a shortest image distance at least 1.75, and an image distance at an apex image point is longer than an image distance at a full field image point (note the discussion above in the rejection of claim 1).

Shimizu further discloses, a lens system (fig. 1) for projecting an object field (image in fig. 1).

While Shimizu is perfectly capable of projecting a virtual flat object field, it is not expressly disclosed by Shimizu nor Nicolas that such an object field is being projected.

Colucci discloses, wherein the object field is a virtual, flat object field (clear from fig. 3 that the intermediate image plane (virtual object field) is flat; again note col. 4, lines 5-24).

As to the further merits of the rejection, the Applicants are directed to the above rejection of claim 16.

*In short, it is seen as obvious to the Examiner that one of ordinary skill in the art would have taken Nicolas' projection and screen and attempted to further extend the*

*display angle coverage of the sphere. Shimizu offers a lens system to allow the light to be bent in such a way as to cover a much larger percentage of the sphere of Nicolas.*

*Then in hopes of bettering the display quality, one would be motivated to include the rear set of lenses of Colucci. These lenses advantageously allow the conflict amongst the rear focal distance and the effective focal length to be diminished (col. 4, lines 41-50). As such the limitations of claim 29 are therein met.*

**With respect to claims 30 and 31,** Nicolas, Shimizu and Colucci disclose, a display system of claim 29 (see above).

As to what degree of coverage the combination will achieve these limitations are seen as optimum values that are obvious and achievable without undue experimentation.

**With respect to claim 32,** Nicolas, Shimizu and Colucci disclose, a display system of claim 30 (see above).

It seems clear to the Examiner that the ray diagram of Shimizu in figure 1 would draw the image field to cover substantially the entire interior of the display surface.

**With respect to claim 33,** Nicolas, Shimizu and Colucci disclose, a display system of claim 30 (see above).

Nicolas further discloses, wherein the image field is approximately spherical (clear from fig. 1).

**With respect to claim 34,** Nicolas, Shimizu and Colucci disclose, a display system of claim 30 (see above).

Shimizu further discloses, wherein ray bundles destined for a full-field image point exit a last clear surface of the lens system at an angle that is substantially perpendicular to an optical axis of the lens system (clear from fig. 1).

**With respect to claim 35,** Nicolas, Shimizu and Colucci disclose, a display system of claim 30 (see above).

Shimizu further discloses a lens array (fig. 1) that is substantially equivalent to the applicant's lens system (applicant's fig. 9a) all the properties of the applicant's lens system would thus inherently be properties of Shimizu's lens array. Therefore Shimizu's lens array is inherently capable of correcting chromatic aberration (also note that the angle of field is 220 degrees).

**With respect to claim 36,** Nicolas, Shimizu and Colucci disclose, a display system of claim 30 (see above).

Shimizu further discloses, that at least one lens has an aspheric surface (note lens, d11 in fig. 1, and its infinite radius of curvature in the table in col. 3).

**With respect to claim 37,** Nicolas, Shimizu and Colucci disclose, a display system of claim 36 (see above).

Shimizu further discloses, wherein the at least one aspheric surface (d11 for example) significantly changes an image distance to an image point, as a function of field height of the image point (note the ray diagram in fig. 1 and the tightening of the ray bundles upon exit of d11).

**With respect to claim 39,** Nicolas, Shimizu and Colucci disclose, a display system of claim 30 (see above).

Shimizu further discloses a lens group with negative power for increasing an exit angle between an optical axis of the lens system and a ray destined for an image point, as a field height of the image point increases (L1- L3, in fig. 1).

**With respect to claim 40,** Nicolas, Shimizu and Colucci disclose, a display system of claim 30 (see above).

Shimizu further discloses wherein, within the lens group, a footprint of a ray bundle destined for an apex image point does not overlap with a footprint of a ray bundle destined for a full field image point (note the separate ray bundles in fig. 1, that do not overlap after L5).

**With respect to claim 41,** Nicolas, Shimizu and Colucci disclose, a display system of claim 30 (see above).

Shimizu further discloses, wherein lenses in the lens group have a flat surface around their rims so that the lenses are properly positioned when the flat surfaces contact each other (see lens rims in fig. 1).

8. Claims 20 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nicolas (US 4,859,053) in view of Shimizu (US 3,737,214) and further in view of Idaszak et al (US 6,530,667).

**With respect to claim 20,** Nicolas and Shimizu disclose, the display system of claim 2 (see above).

Neither Nicolas nor Shimizu expressly disclose wherein the image field is axially asymmetric about an optical axis.

Idaszak discloses, an axially asymmetric image field (22 in fig. 12, col. 8, lines 35-40).

Idaszak, Nicolas and Shimizu are analogous art because they are all from the same field of endeavor namely, wide-angle projection systems.

At the time of the invention, it would have been obvious to create axially asymmetric image fields on the geometric surfaces of Nicolas and Shimizu as taught by Idaszak.

The motivation for doing so would have been to make the projection system adaptable to different display surfaces.

Therefore it would have been obvious to combine Nicolas and Shimizu with Idaszak for the benefit of different shaped display surfaces to obtain the invention as specified in claim 20.

**With respect to claim 28,** Nicolas and Shimizu disclose, the display system of claim 2 (see above).

Neither Nicolas nor Shimizu expressly disclose, wherein the projection system generates an image suitable for stereoscopic display.

Idaszak discloses the projection system generates an image suitable for stereoscopic display (col. 7, lines 19-28).

At the time of the invention, it would have been obvious to generate images that are stereoscopic, as disclosed by Idaszak, for use in the display system of Nicolas and Shimizu.

The motivation for doing so would have been to generate a three-dimensional effect to the user.

Therefore it would have been obvious to combine Nicolas and Shimizu with Idaszak for the benefit of a 3D effect for the user to obtain the invention as specified in claim 28.

9. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nicolas (US 4,859,053) in view of Shimizu (US 3,737,214) and further in view of Jaulmes (US 4,464,029).

**With respect to claim 21,** Nicolas and Shimizu disclose, the display system of claim 2 (see above).

Neither Nicolas and Shimizu expressly disclose the object field is non-circular.

Jaulmes discloses an object field that is non-circular (fig. 3).

Jaulmes, Nicolas and Shimizu are analogous art because they are from the same field of endeavor namely wide-angle projection systems.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to replace the projection system of Nicolas and Shimizu with the film projection system, with non-circular object fields, of Jaulmes.

The motivation for doing so would have been to efficiently utilize the whole length of the film.

Therefore it would have been obvious to combine Jaulmes with Nicolas and Shimizu for the benefit of efficient film usage to obtain the invention as specified in claim 21.

10. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nicolas (US 4,859,053) in view of Shimizu (US 3,737,214) and further in view of Courchesne (US 6,905,218).

**With respect to claim 26,** Nicolas and Shimizu disclose, the display system of claim 2 (see above).

Neither Nicolas nor Shimizu expressly disclose, wherein the interior of the display surface is reflective.

Courchesne discloses, wherein the interior of the display surface is reflective (fig. 9).

Courchesne, Nicolas and Shimizu are analogous art because they are both directed to the same field of endeavor namely, spherical projection systems.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to construct the display system of Nicolas and Shimizu for operation in the manner as taught by Courchesne, by making the display surface both large enough and reflective.

The motivation for doing so would have been to provide a sense of immersion to the user (Courchesne, col. 3, line 63).

Therefore it would have been obvious to combine Courchesne with Nicolas and Shimizu for the benefit of a more immersive experience for the user to obtain the invention as specified in claim 26.

11. Claims 38 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nicolas (US 4,859,053) in view of Shimizu (US 3,737,214) and Colucci et al. (US 6,880,939) and further in view of Ikeda et al (US 6,560,041).

**With respect to claim 38,** Nicolas, Shimizu and Colucci disclose, a display system of claim 37 (see above).

Shimizu further discloses a footprint of a ray bundle destined for an apex image point does not overlap with a footprint of a ray bundle destined for a full field image point (note the ray diagram in fig. 1 at the surface of L5).

Neither Nicolas, Shimizu nor Colucci expressly discloses that the surface of L5 is aspheric.

Ikeda discloses, a lens system that is very similar to that of Shimizu. Ikeda also discloses, using aspherical surfaces on those lenses (col. 2, lines 31-41).

Nicolas, Shimizu, Colucci, and Ikeda are all analogous art because they are directed to a similar problem solving area namely, wide-angle optical systems.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to make the surface of L5 of the lens system of Nicolas, Shimizu and Colucci aspheric as taught by Ikeda.

The motivation for doing so would have been to correct distortion and chromatic aberration (Ikeda, col. 2, lines 34-37).

Therefore it would have been obvious to combine Ikeda with Nicolas, Shimizu and Colucci for the benefit of correcting aberration to obtain the invention as specified in claim 38.

**With respect to claim 42,** Nicolas, Shimizu and Colucci disclose, a display system of claim 30 (see above).

Shimizu further discloses, wherein the lens system comprises, in the following order along an optical axis: a first lens group located close to an aperture of the lens system (d11-d22), the first lens group correcting for chromatic aberration; a second lens group (L4, L5); and a third lens group with negative power for increasing an exit angle between the optical axis and a ray destined for an image point (L1, L2, L3), as a field height of the image point increases, wherein the second lens group acts as a partial field lens between the first lens group and the third lens group (as the lens array of Shimizu (fig. 1) is substantially equivalent to the lens system of the applicants (fig. 9a) the behavior of the optics is also equivalent.).

Neither Nicolas, Colucci or Shimizu disclose, that the second lens group includes an aspheric surface, for significantly changing an image distance to an image point as a function of field height of the image point.

Ikeda discloses, a lens system that is very similar to that of Shimizu. Ikeda also discloses, using aspherical surfaces on those lenses (col. 2, lines 31-41).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to make the surface of L5 of the lens system of Shimizu and Nicolas aspheric as suggested by Ikeda.

The motivation for doing so would have been to correct distortion and chromatic aberration (Ikeda, col. 2, lines 34-37).

Therefore it would have been obvious to combine Ikeda with Nicolas, Colucci and Shimizu for the benefit of correcting aberration to obtain the invention as specified in claim 42.

12. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nicolas (US 4,859,053) in view of Shimizu (US 3,737,214) and Colucci et al. (US 6,880,939) and further in view of Jaulmes (US 4,464,029).

**With respect to claim 43,** Nicolas, Shimizu and Colucci disclose, a display system of claim 30 (see above).

Neither Nicolas, Shimizu nor Colucci expressly disclose, wherein the object field is asymmetric about an optical axis of the lens system.

Jaulmes discloses an object field that is non-circular (fig. 3).

Nicolas, Shimizu, Colucci and Jaulmes are analogous art because they are from the same field of endeavor namely wide-angle optical systems.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to replace the laser projection system of Nicolas, Shimizu and Colucci with the film projection system with non-circular object fields of Jaulmes.

The motivation for doing so would have been to utilize the whole length of the films, which is provided for each image (Jaulmes; col. 2, lines 30-36).

Therefore it would have been obvious to combine Jaulmes with Nicolas, Shimizu and Colucci for the benefit of efficient use of the film to obtain the invention as specified in claim 43.

***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, call the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wlb
2/12/07

AMR A. AWAD
SUPERVISORY PATENT EXAMINER